

*PLAY VERSUS ALONE CONDITIONS AS  
CONTROLS DURING FUNCTIONAL ANALYSES OF  
SELF-INJURIOUS ESCAPE BEHAVIOR*

SUNGWOO KAHNG AND BRIAN A. IWATA

THE UNIVERSITY OF FLORIDA

We compared the effects of continuous reinforcement (play) and alone conditions as controls during functional analyses for 66 individuals whose self-injurious behavior (SIB) was maintained by escape. In every case, SIB was lower during both control conditions than it was during the test (demand) condition. However, SIB was lowest during the alone condition more often than it was during the play condition. Circumstances under which the alone condition might serve as an alternative or more suitable control for escape-maintained problem behaviors are discussed.

DESCRIPTORS: functional analysis, escape behavior, negative reinforcement, self-injurious behavior

Assessment procedures based on functional analysis methodology (e.g., Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994) are considered to be the most precise techniques for identifying variables that maintain behavior disorders. In the typical functional analysis, behavior is observed under several test conditions (in which the variable of interest is present) and is compared with that observed under a control condition (in which the variable is absent). A common control condition found in many studies has been described as the “play” or “leisure” condition and is characterized by the absence of demands, the continuous availability of leisure activities, and the frequent delivery of attention on a noncontingent (response-independent) basis.

Although the play condition may serve as an ideal control during functional analyses of behavior problems that are maintained by contingent attention and other forms of positive reinforcement (Fischer, Iwata, & Worsdell, 1997), it may occasionally present difficulty when used as the control for behavior

problems that are maintained by negative reinforcement, such as escape from task demands. Even though no demands are delivered during the play condition, higher rates of problem behavior than would be expected might be observed if the presence of the therapist has acquired discriminative or conditioned aversive properties (e.g., Taylor, Ekdahl, Romanczyk, & Miller, 1994). Thus, it is possible that an “alone” condition, which is typically a test condition for behavioral persistence in the absence of social stimulation (automatic reinforcement), might serve as an alternative control during the assessment of escape behavior for some individuals because the alone condition is highly salient for the absence of demands. The purpose of this study was to compare the play and alone conditions as controls for the assessment of escape behavior by examining a large set of functional analysis data for individuals whose self-injurious behavior (SIB) was maintained by escape.

## METHOD

### *Participants and Setting*

Participants consisted of 66 individuals who had been diagnosed with mental retar-

This research was supported in part by a grant from the Florida Department of Children and Families.

Reprints may be obtained from Brian Iwata, Department of Psychology, The University of Florida, Gainesville, Florida 32611.

dation and had been referred for the assessment and treatment of SIB. This sample was selected from a larger pool based on only one criterion: Results of a functional analysis for each participant revealed that SIB was maintained by negative reinforcement (i.e., SIB was highest in the demand condition; see below). Topographies of SIB were defined for each individual, and data were collected on occurrences of SIB via 10-s partial-interval recording during 15-min sessions conducted several times per day. The mean length of assessment was 24 sessions (range, 12 to 44 sessions). An independent observer collected data during a mean of 31.0% of the sessions (range, 22.0% to 59.0%). Interobserver agreement was calculated based on interval-by-interval comparison of observers' records (agreements divided by agreements plus disagreements and multiplied by 100%) and yielded a mean agreement score of 92.3% (range, 83.8% to 100%).

Sessions were conducted individually in therapy rooms containing furniture and other materials necessary to conduct the various sessions. All individuals were exposed to attention, demand, alone, and play conditions in multielement designs based on procedures described by Iwata et al. (1982/1994). Most individuals also subsequently participated in one or more treatment studies, whose data are reported elsewhere. However, for the purposes of this analysis, only three conditions from the functional analysis were considered: (a) During the demand condition, an experimenter presented instructional trials to the participant, usually on a fixed-time (FT) 30-s schedule using a three-prompt sequence (an initial instruction, followed if necessary by a gestural prompt, and then physical guidance). If the participant complied with the instruction, the experimenter delivered praise. If the participant engaged in SIB during the trial, the experimenter removed the task materials and ignored the

participant until the next scheduled trial. (b) During the alone condition, the participant was observed while alone in a room that contained no leisure items. (c) During the play condition, leisure items were available throughout the session, and the experimenter delivered noncontingent attention to the participant (e.g., praised the participant for manipulating leisure items) on an FT 30-s schedule. No instructions were presented, and no social consequences were delivered following occurrences of SIB.

## RESULTS AND DISCUSSION

Figure 1 shows the mean percentages of intervals in which SIB occurred during the demand, alone, and play conditions for all 66 participants. SIB was highest during the demand condition for each participant, although the absolute level of SIB during that condition varied considerably across individuals (note that *y* axes vary according to the graph). These results were consistent with previous research on the functional analysis of behavior disorders in that the play condition was an adequate control for SIB maintained by escape. However, although SIB was lowest (or about the lowest) in the play condition for over half (34) of the 66 participants, SIB was lowest (or about the lowest) in the alone condition for over two thirds (45) of the participants. Moreover, whereas SIB occurred at a relatively high level during the play condition in five cases (see Participants 1, 23, 31, 43, and 47), SIB occurred at a relatively high level during the alone condition in only three cases (see Participants 44, 46, and 56).

Figure 2 exemplifies a large discrepancy between levels of SIB in the alone and play conditions. Participant 23 consistently engaged in low levels of SIB in the alone condition. By contrast, SIB was initially high in the play condition. During the course of assessment, SIB decreased in the play condi-

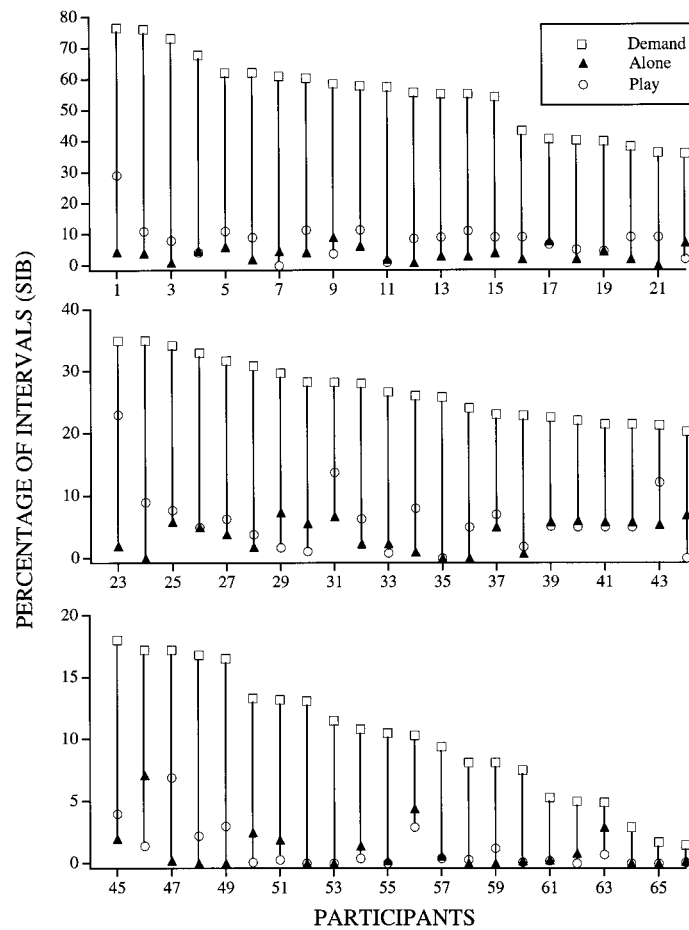


Figure 1. Mean percentage of intervals in which SIB occurred during the demand, play, and alone conditions.

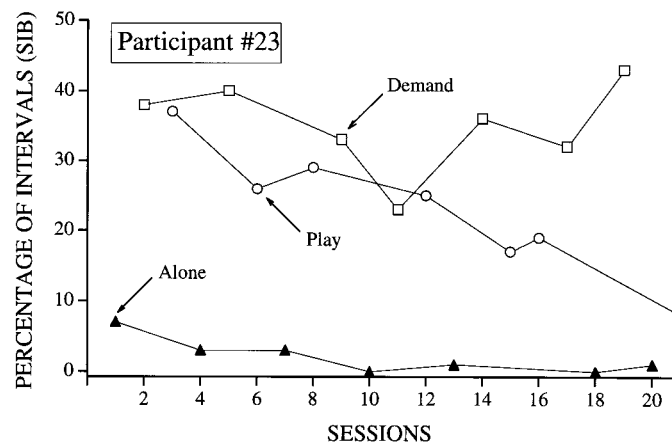


Figure 2. Session-by-session results during the demand, play, and alone conditions for Participant 23.

tion, although not to the levels obtained during the alone condition. Thus, by the end of assessment, data from the demand, alone, and play conditions all clearly indicated that SIB was maintained by escape. However, had the assessment been limited to five or six replications of each condition, which exceeds the number of replications commonly included in brief functional analyses, conclusions about behavioral function would have been obscured.

The most likely explanation for the finding that SIB was generally lower in the alone condition than in the play condition is that the presence of the experimenter during the play condition served a discriminative function. That is, from the participant's perspective, the mere presence of a teacher or therapist in the play condition is correlated with an increased probability that instructions (demands) might be delivered; by contrast, the probability of demands is zero only when no one is around (i.e., the alone condition). It is also possible that some of the participants had histories of negative interactions with other therapists, such that attention (albeit "positive") delivered by the experimenters in this study amounted to aversive stimulation.

In light of these findings, it appears that the alone condition may be an adequate control for the presence of demands and contingent escape during functional analyses

and may be more suitable than the play condition under some circumstances (e.g., during brief functional analyses). Alternatively, if the play condition is used as a control (as is often done), the presence of different therapists in the play and demand conditions may decrease the likelihood that discriminative functions are acquired. Finally, it is important to note that the target behavior, SIB, could have occurred during any of the conditions of the functional analysis. We emphasize this fact because behavior problems that, by their very nature, are social responses (e.g., aggression) simply cannot occur during an alone condition, thereby rendering its utility somewhat questionable.

## REFERENCES

- Fischer, S. M., Iwata, B. A., & Worsdell, A. S. (1997). Attention as an establishing operation and as reinforcement during functional analyses. *Journal of Applied Behavior Analysis*, 30, 335-338.
- Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis*, 27, 197-209. (Reprinted from *Analysis and Intervention in Developmental Disabilities*, 2, 3-20, 1982)
- Taylor, J. T., Ekdahl, M. M., Romanczyk, R. G., & Miller, M. L. (1994). Escape behavior in task situations: Task versus social antecedents. *Journal of Autism and Developmental Disorders*, 24, 331-344.

*Received November 17, 1997*

*Initial editorial decision January 13, 1998*

*Final acceptance April 28, 1998*

*Action Editor, Cathleen C. Piazza*